

REMARKS

Overview of the Office Action

The drawings have been objected to for not showing every feature of the invention recited in the claims.

The specification has been objected to because it is unclear what items 1-27 are referring to.

The title of the invention has been objected to for not being descriptive.

The listing of the references in the specification is not considered a proper information disclosure statement.

Claims 1-20 have been objected to for multiple instances of incorrect English grammar.

Claims 9 and 11 have been rejected under 35 U.S.C. §112, first paragraph, for failing to comply with the enablement requirement.

Claims 2, 3, 5, and 6 have been rejected under 35 U.S.C. §112, second paragraph, as indefinite.

Claims 1-8, 10-12, 15, and 17-19 have been rejected under 35 U.S.C. §103(a) as unpatentable over U.S. Patent No. 6,469,838 to Tawa et al. ("Tawa") in view of European Patent Pub. No. EP1300838 to Nishino et al. ("Nishino").

Claim 9 has been rejected under 35 U.S.C. §103(a) as unpatentable over Tawa in view of Nishino, and further in view of U.S. Patent No. 6,014, 361 to Nagashima et al. ("Nagashima").

Claims 13 and 14 have been rejected under 35 U.S.C. §103(a) as unpatentable over Tawa in view of Nishino, and further in view of U.S. Patent Pub. No. 2001/0028626 to Maruyama et al. ("Maruyama").

Claim 16 has been rejected under 35 U.S.C. §103(a) as unpatentable over Tawa in view of Nishino, and further in view of U.S. Patent No. 5,818,809 to Arai et al. (“Arai”).

Claim 20 has been rejected under 35 U.S.C. §103(a) as unpatentable over Tawa in view of Nishino, and further in view of U.S. Patent No. 6,442,124 to Chung et al. (“Chung”).

Claim Status

Claim 9 has been canceled.

Claims 1-6, 11, and 15 have been amended.

Claims 21-23 have been newly added.

Claims 1-8 and 10-23 are now pending.

Objection to the drawings

The Office Action states that the “optical intensity distribution converting element structuring a beam shaper” recited in claim 11 must be shown in the figures or canceled.

The “optical intensity distribution converting element structuring a beam shaper” is actually recited in claim 9, which has been canceled. Therefore, this objection is now moot.

Objections to the Specification

The Office Action states that the specification has been objected to because it is unclear what items 1-27 are referring to. The specification has been amended to delete all references to items 1-27.

The Office Action states that the title of the invention has been objected to for not being descriptive. The title of the invention has been amended to be descriptive.

Applicants' submit that these objections have been overcome.

Information Disclosure Statement

The Office Action states that listing of the references in the specification is not considered a proper information disclosure statement.

The reference cited in the original English specification is Japanese Patent No. 3370612. The U.S. Patent No. 6,469,838 to Tawa et al, which was cited in the Office Action by the Examiner, is a corresponding U.S. patent that claims priority to Japanese Patent application 10-260281, which was published as JP 2000-89161. We now submit Japanese Publication No. JP 2000-89161 in the IDS filed concurrently herewith.

Objections to the claims

The Office Action states that claims 1-20 have been objected to for multiple instances of incorrect English grammar.

The claims have been amended to correct the instances of incorrect grammar.

The Office Action states that claims 5 and 6 have been objected to because the limitation "one element structuring the beam expander" indicates that there may be more than one element comprising the beam expander, yet the number of elements is not specified in the claims.

Claims 4, 5, and 6 have been amended to clarify the elements the beam expander is comprised of.

The Office Action states that claim 15 has been objected to because the limitation "0.65 and more" should be changed to "0.65 or more". Claim 15 has been amended according to the Examiner's suggestion.

In view of the above amendments and remarks, these objections have now been overcome.

Rejection of claims 9 and 11 have been rejected under 35 U.S.C. §112, first paragraph

The Office Action states that claim 9 fails to comply with the enablement requirement. Claim 9 has been canceled, thereby rendering this rejection moot.

The Office Action states that claim 11 fails to comply with the enablement requirement because the specification fails to disclose how the light intensity distribution element is partially changeable.

Claim 11 has been amended to clarify that the light intensity ratio of the outgoing light flux to the incident light flux is different corresponding to the portion of the light intensity distribution converting element, as shown in Applicants' Fig.4.

In view of the above amendment and remark, this rejection is now overcome.

Rejection of claims 2, 3, 5, and 6 under 35 U.S.C. §112, second paragraph

The Office Action states that claims 2, 3, 5, and 6 are indefinite because it is unclear how many light intensity distributions in nearly Gaussian distribution, light fluxes emitted the light source, desired intensity distributions, light intensities of outgoing light, outermost peripheries, effective apertures, and optical axis positions are intended to be claimed.

Claims 2, 3, 5, and 6 have been amended to clarify what Applicants intend to claim.

In view of the above amendments and remarks, these rejections have now been overcome.

Summary of subject matter disclosed in the specification

The following descriptive details are based on the specification. They are provided only for the convenience of the Examiner as part of the discussion presented herein, and are not intended to argue limitations, which are unclaimed.

The specification discloses an optical pickup apparatus for reproducing and/or recording information on an optical information recording medium. The apparatus includes a light source to emit a light flux with a wavelength in the range of 200-700 nm (see e.g. page 9, line 3, of the specification as originally filed). The emitted light flux has a light intensity distribution in nearly Gaussian distribution (see page 9, lines 4-8). The apparatus further includes a light intensity distribution converting element to transform the light intensity distribution of the light flux emitted by the light source into a desired light intensity distribution wherein a light intensity of an outgoing light passing through an outermost periphery of an effective aperture of the light intensity distribution converting element becomes 45%-95% of a light intensity of an outgoing light passing through an optical axis position of the light intensity distribution converting element (page 9, lines 4-11). The apparatus further includes an objective optical element to converge a light flux emitted by the light intensity distribution converting element onto an information recording surface of the optical information recording medium (page 9, lines 11-15).

Descriptive summary of Tawa

Tawa discloses a light intensity distribution converting device that is formed by a transparent body having a first curved surface, a second curved surface, and an outer circumferential surface extending between the first and second curved surfaces (see col. 3, line 64 - col. 4, line 3; and Figs. 1-2 of Tawa). One of a first and a second surface has a concave

surface configuration and the other has a convex surface configuration (col. 4, lines 25-27).

Diverging light is made incident to the first curved surface. The light intensity distribution of light made incident to the body from first curved surface is different from that of light emerging from the body from the second curved surface due to refractions at the first and second curved surfaces. The light intensity distribution converting device can be used as a collimator lens or an objective lens in an optical data storing apparatus.

Descriptive summary of Nishino

Nishino discloses an optical head device that includes a focusing optical system for focusing a laser beam emitted from a semiconductor laser light source (10) on an optical information medium (3) with an objective lens (1). A chromatic aberration correction element (7) for correcting chromatic aberration occurring in the objective lens (1) is provided between the semiconductor laser light source (10) and the optical information medium (3). A light distribution correction element (6) in which the transmittance increases with the distance from the center of the aperture surface of the objective lens (1) is provided to correct a reduction of the intensity of the light incident on the aperture surface of the objective lens (1) with the distance from the center of the aperture surface.

Claims 1-8, 10-12, 15, and 17-19 are allowable over Tawa and Nishino under 35 U.S.C. §103(a)

The Office Action states that the combination of Tawa and Nishino teaches all of Applicants' recited elements.

Independent claim 1 has been amended to recite an optical pickup apparatus for reproducing and/or recording information on an optical information recording medium that includes "a light intensity distribution converting element to transform the light intensity

distribution of the light flux emitted by the light source into a desired light intensity distribution wherein a light intensity of an outgoing light passing through an outermost periphery of an effective aperture of the light intensity distribution converting element becomes 45%-95% of a light intensity of an outgoing light passing through an optical axis position of the light intensity distribution converting element”.

Tawa and Nishino, whether taken alone or in combination, fail to teach or suggest "wherein a light intensity of an outgoing light passing through an outermost periphery of an effective aperture of the light intensity distribution converting element becomes 45 % - 95 % of a light intensity of an outgoing light passing through an optical axis position of the light intensity distribution converting element", as recited in Applicants' amended independent claim 1.

The purpose of the device disclosed in Tawa is to obtain "a pencil of light having a uniform light intensity distribution" so that a smaller beam spot diameter can be obtained (see column 1, lines 34-37 of Tawa). The ideal situation for the device of Tawa is a light intensity distribution converting device emitting light with a uniform light intensity distribution. Tawa shows that light emerges from the body from the second curved surface as parallel light having a uniform light intensity distribution (see column 4, lines 44-46, column 8, lines 35-37, and Fig. 1, Fig. 2, and Fig. 15 of Tawa).

However, as described in Applicants' specification, in an optical pick-up device, when the light intensity distribution of the light flux incident on the objective lens is equalized, there is a possibility that the side-robe of the spot light on the information recording surface will be too large and the certainty of the information being recording and/or reproduced is reduced (see page 4, lines 17-23 of Applicants' specification). Further, when the peripheral intensity ratio is 100% (i.e., a uniform light intensity distribution), the ratio of the side-robe is increased by about 1.8%,

and there is a possibility that the recording and/or reproducing of the information will be negatively affected (see page 6, line 20- page 7, line 2 of Applicants' specification). Therefore, Applicants apparatus does not involve a light intensity distribution converting element that emits a uniform light intensity distribution.

When the peripheral intensity ratio of Applicants' invention is not smaller than 45%, the beam diameter is small, and when the peripheral intensity ratio is not larger than 95%, an increase of the side-lobe is suppressed. Thus, the recording and/or reproducing of the information can be achieved (see page 7, lines 3-8 of Applicants' originally filed specification).

Tawa fails to teach or suggest any range of the ratio of the light intensity of an outgoing light passing through an outermost periphery and the light intensity of an outgoing light passing through an optical axis position. Therefore, Tawa does not teach or suggest subject matter recited in Applicants' amended independent claim 1.

The Examiner cites col. 8, lines 49-58 of Tawa as teaching a light intensity of an outgoing light passing through an outermost periphery of an effective aperture of the light intensity distribution converting element becomes 45 % - 95 % of a light intensity of an outgoing light passing through an optical axis position of the light intensity distribution converting element. Applicants submit that the cited passages have been misinterpreted.

The cited passages of Tawa recite: "FIGS. 14A to 14C show examples of a variety of converted light intensity distributions. A cylindrical uniform light intensity distribution is shown in FIG. 14A. A light intensity distribution having a combination of a cylinder and a cone, in which the intensity is high particularly at the center thereof is shown in FIG. 14B. A conical light intensity distribution is shown in FIG. 14C. In the present invention, the light intensity distribution converting device 10, which can emit light having various light intensity

distributions, can be obtained.” However, nothing in the cited passages of Tara teaches or suggests “a light intensity of an outgoing light passing through an outermost periphery of an effective aperture of the light intensity distribution converting element becomes 45 % - 95 % of a light intensity of an outgoing light passing through an optical axis position of the light intensity distribution converting element”, as recited in Applicants’ amended independent claim 1.

Nishino fails to teach or suggest a light intensity distribution converting element. Nishino also fails to teach or suggest "wherein a light intensity of an outgoing light passing through an outermost periphery of an effective aperture of the light intensity distribution converting element becomes 45 % - 95 % of a light intensity of an outgoing light passing through an optical axis position of the light intensity distribution converting element", as recited in Applicants’ amended independent claim 1.

In view of the foregoing, it is respectfully submitted that Tawa and Nishino, whether taken alone or in combination, do not teach or suggest the subject matter recited in Applicants’ amended independent claim 1. Specifically, Tawa and Nishino fail to teach or suggest, "wherein a light intensity of an outgoing light passing through an outermost periphery of an effective aperture of the light intensity distribution converting element becomes 45 % - 95 % of a light intensity of an outgoing light passing through an optical axis position of the light intensity distribution converting element". Accordingly, claim 1 is patentable over Tawa and Nishino under 35 U.S.C. §103(a).

Dependent claims

Claims 2-8, 10-12, 15, and 17-19, which depend directly or indirectly from amended independent claim 1, incorporate all of the limitations of independent claim 1 and are therefore

deemed to be patentably distinct over Tawa and Nishino for at least those reasons discussed above with respect to amended independent claim 1.

Rejection of claim 9 under 35 U.S.C. §103(a)

The Office Action states that the combination of Tawa, Nishino, and Nagashima teaches all of Applicants' recited elements.

Claim 9 has been canceled. Therefore, this rejection is now moot.

Claims 13 and 14 are allowable over Tawa, Nishino, and Maruyama under 35 U.S.C. §103(a)

The Office Action states that the combination of Tawa, Nishino, and Maruyama teaches all of Applicants' recited elements.

As previously discussed, Tawa and Nishino do not teach or suggest the subject matter recited in Applicants' amended independent claim 1.

Because Tawa and Nishino do not teach or suggest the subject matter recited in amended independent claim 1, and because Maruyama does not teach or suggest the elements of claim 1 that Tawa and Nishino are missing, the addition of Maruyama does not remedy the non-obviousness of the claims.

Claims 13 and 14, which depend directly or indirectly from amended independent claim 1, incorporate all of the limitations of independent claim 1 and is therefore deemed to be patentably distinct over Tawa, Nishino, and Maruyama for at least those reasons discussed above with respect to amended independent claim 1.

Claim 16 is allowable over Tawa, Nishino, and Arai under 35 U.S.C. §103(a)

The Office Action states that the combination of Tawa, Nishino, and Arai teaches all of Applicants' recited elements.

As previously discussed, Tawa and Nishino do not teach or suggest the subject matter recited in Applicants' amended independent claim 1.

Because Tawa and Nishino do not teach or suggest the subject matter recited in amended independent claim 1, and because Arai does not teach or suggest the elements of claim 1 that Tawa and Nishino are missing, the addition of Arai does not remedy the non-obviousness of the claims.

Claim 16, which depends directly from amended independent claim 1, incorporates all of the limitations of independent claim 1 and is therefore deemed to be patentably distinct over Tawa, Nishino, and Arai for at least those reasons discussed above with respect to amended independent claim 1.

Claim 20 is allowable over Tawa, Nishino, and Chung under 35 U.S.C. §103(a)

The Office Action states that the combination of Tawa, Nishino, and Chung teaches all of Applicants' recited elements.

As previously discussed, Tawa and Nishino do not teach or suggest the subject matter recited in Applicants' amended independent claim 1.

Because Tawa and Nishino do not teach or suggest the subject matter recited in amended independent claim 1, and because Chung does not teach or suggest the elements of claim 1 that Tawa and Nishino are missing, the addition of Chung does not remedy the non-obviousness of the claims.

Claim 20, which depends directly from amended independent claim 1, incorporates all of the limitations of independent claim 1 and is therefore deemed to be patentably distinct over Tawa, Nishino, and Chung for at least those reasons discussed above with respect to amended independent claim 1.

Newly added claims 21-23

Claims 21-23 have been newly added. Support for newly added claim 21 can be found least on page 19, line 13; page 21, lines 5-6; page 22, line 14; page 23, lines 15-16; page 24, lines 18-19; and page 25, lines 13-14 of the originally filed specification. Support for newly added claim 22 can be found least on page 19, lines 12-23; page 22, lines 9-21; and page 24, line 17- page 25, line 7 of the originally filed specification. Support for newly added claim 23 can be found least in Fig. 4:


Conclusion

In view of the foregoing, reconsideration and withdrawal of all rejections, and allowance of all pending claims is respectfully solicited.

Should the Examiner have any comments, questions, suggestions, or objections, the Examiner is respectfully requested to telephone the undersigned in order to facilitate reaching a resolution of any outstanding issues.

Respectfully submitted,

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